

SEQUENCE LISTING

<110> Hurst, Deborah
 Long, Li
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 Lopes de Menezes, Daniel E.
 Yabannavar, Asha
 Zaror, Isabel

<120> Methods of Therapy for Cancers
 Expressing the CD40 Antigen

<130> PP23220.001 (281250)

<150> 60/565,710
 <151> 2004-04-27

<150> 60/525,579
 <151> 2003-11-26

<150> 60/517,337
 <151> 2003-11-04

<160> 18

<170> FastSEQ for Windows Version 4.0

<210> 1
 <211> 720
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Coding sequence for light chain of CHIR-12.12
 human anti-CD40 antibody

<221> CDS
 <222> (1)...(720)

<400> 1
 atg gcg ctc cct gct cag ctc ctg ggg ctg cta atg ctc tgg gtc tct 48
 Met Ala Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Ser
 1 5 10 15
 gga tcc agt ggg gat att gtg atg act cag tct cca ctc tcc ctg acc 96
 Gly Ser Ser Gly Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Thr
 20 25 30
 gtc acc cct gga gag ccg gcc tcc atc tcc tgc agg tcc agt cag agc 144
 Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser
 35 40 45
 ctc ctg tat agt aat gga tac aac tat ttg gat tgg tac ctg cag aag 192
 Leu Leu Tyr Ser Asn Gly Tyr Asn Tyr Leu Asp Trp Tyr Leu Gln Lys
 50 55 60
 cca ggg cag tct cca cag gtc ctg atc tct ttg ggt tct aat cgg gcc 240
 Pro Gly Gln Ser Pro Gln Val Leu Ile Ser Leu Gly Ser Asn Arg Ala
 65 70 75 80
 tcc ggg gtc cct gac agg ttc agt ggc agt gga tca ggc aca gat ttt 288
 Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
 85 90 95

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aca ctg aaa atc agc aga gtg gag gct gag gat gtt ggg gtt tat tac 336
Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
      100      105      110

tgc atg caa gct cga caa act cca ttc act ttc ggc cct ggg acc aaa 384
Cys Met Gln Ala Arg Gln Thr Pro Phe Thr Phe Gly Pro Gly Thr Lys
      115      120      125

gtg gat atc aga cga act gtg gct gca cca tct gtc ttc atc ttc ccg 432
Val Asp Ile Arg Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro
      130      135      140

cca tct gat gag cag ttg aaa tct gga act gcc tct gtt gtg tgc ctg 480
Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu
      145      150      155      160

ctg aat aac ttc tat ccc aga gag gcc aaa gta cag tgg aag gtg gat 528
Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp
      165      170      175

aac gcc ctc caa tcg ggt aac tcc cag gag agt gtc aca gag cag gac 576
Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp
      180      185      190

agc aag gac agc acc tac agc ctc agc agc acc ctg acg ctg agc aaa 624
Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys
      195      200      205

gca gac tac gag aaa cac aaa gtc tac gcc tgc gaa gtc acc cat cag 672
Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln
      210      215      220

ggc ctg agc tcg ccc gtc aca aag agc ttc aac agg gga gag tgt tag 720
Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys *
      225      230      235

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<210> 2

<211> 239

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain of CHIR-12.12 human anti-CD40 antibody

<400> 2

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Met Ala Leu Pro Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Ser
 1      5      10      15
Gly Ser Ser Gly Asp Ile Val Met Thr Gln Ser Pro Leu Ser Leu Thr
 20      25      30
Val Thr Pro Gly Glu Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser
 35      40      45
Leu Leu Tyr Ser Asn Gly Tyr Asn Tyr Leu Asp Trp Tyr Leu Gln Lys
 50      55      60
Pro Gly Gln Ser Pro Gln Val Leu Ile Ser Leu Gly Ser Asn Arg Ala
 65      70      75      80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe
 85      90      95
Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
100      105      110
Cys Met Gln Ala Arg Gln Thr Pro Phe Thr Phe Gly Pro Gly Thr Lys
115      120      125
Val Asp Ile Arg Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro
130      135      140
Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu

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| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 145 | | 150 | | 155 | | 160 | | | | | | | | | |
| Leu | Asn | Asn | Phe | Tyr | Pro | Arg | Glu | Ala | Lys | Val | Gln | Trp | Lys | Val | Asp |
| | | 165 | | | | | | | 170 | | | | | 175 | |
| Asn | Ala | Leu | Gln | Ser | Gly | Asn | Ser | Gln | Glu | Ser | Val | Thr | Glu | Gln | Asp |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Ser | Lys | Asp | Ser | Thr | Tyr | Ser | Leu | Ser | Ser | Thr | Leu | Thr | Leu | Ser | Lys |
| | | 195 | | | | | 200 | | | | | 205 | | | |
| Ala | Asp | Tyr | Glu | Lys | His | Lys | Val | Tyr | Ala | Cys | Glu | Val | Thr | His | Gln |
| | 210 | | | | | 215 | | | | | 220 | | | | |
| Gly | Leu | Ser | Ser | Pro | Val | Thr | Lys | Ser | Phe | Asn | Arg | Gly | Glu | Cys | |
| 225 | | | | 230 | | | | | | 235 | | | | | |

<210> 3

<211> 2016

<212> DNA

<213> Artificial Sequence

<220>

<223> Coding sequence for heavy chain of CHIR-12.12
human anti-CD40 antibody (with introns)

<400> 3

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|-------------|------------|-------------|-------------|-------------|-------------|------|
| atggagtttg | ggctgagctg | gggttttcctt | gttgctattt | taagagggtg | ccagtgtcag | 60 |
| gtgcagtttg | tggagtctgg | gggaggcgtg | gtccagcctg | ggaggtccct | gagactctcc | 120 |
| tgtgcagcct | ctggattcac | cttcagtagc | tatggcatgc | actgggtccg | ccagggtcca | 180 |
| ggcaaggggc | tggagtgggt | ggcagttata | tcatatgagg | aaagtaatag | ataccatgca | 240 |
| gactccgtga | agggccgatt | caccatctcc | agagacaatt | ccaagatcac | gctgtatctg | 300 |
| caaatgaaca | gcctcagaac | tgaggacacg | gctgtgtatt | actgtgctgag | agatgggggt | 360 |
| atagcagcac | ctgggcctga | ctactggggc | caggggaacc | tggtcaccgt | ctcctcagca | 420 |
| agtaccaagg | gcccatccgt | cttccccctg | gcgcccgtta | gcaagagcac | ctctgggggc | 480 |
| acagcgccgc | tgggctgcct | gggtcaaggac | tacttccccg | aaccggtgac | ggtgtcgtgg | 540 |
| aactcaggcg | ccctgaccag | cggcgtgcac | accttccccg | ctgtcctaca | gtcctcagga | 600 |
| ctctactccc | tcagcagcgt | gggtgaccgt | ccctccagca | gcttggggc | ccagacctac | 660 |
| atctgcaacg | tgaatcaca | gcccagcaac | accaagggtg | acaagagagt | tggtagaggg | 720 |
| ccagcacagg | gagggagggg | gtctgctgga | agccaggctc | agcgctcctg | cctggacgca | 780 |
| tcccggctat | gcagtcccag | tccagggcag | caaggcaggc | cccgtctgcc | tcttcacccg | 840 |
| gaggcctctg | cccgcctcc | tcagtctcag | ggagagggtc | ttctggcttt | ttccccaggc | 900 |
| tctgggcagg | cacaggctag | gtgcccctaa | cccaggccct | gcacacaaag | gggcagggtgc | 960 |
| tgggctcaga | cctgccaaga | gccatatccg | ggaggaccct | gcccctgacc | taagcccacc | 1020 |
| ccaaaggcca | aactctccac | tccctcagct | cggacacctt | ctctcctccc | agattccagt | 1080 |
| aactcccaat | cttctctctg | cagagcccaa | atcttgtgac | aaaactcaca | catgcccacc | 1140 |
| gtgcccagggt | aagccagccc | aggcctcgcc | ctccagctca | aggcgggaca | ggtgcccctag | 1200 |
| agtgcctgac | atccagggac | aggccccagc | cgggtgctga | cacgtccacc | tccatctctt | 1260 |
| cctcagcacc | tgaactcctg | gggggaccgt | cagtcttcct | cttcccccca | aaacccaagg | 1320 |
| acaccctcat | gatctcccgg | accctgagg | tcacatgcgt | ggtggtggac | gtgagccacg | 1380 |
| aagaccctga | ggtcaagttc | aactggtacg | tggacggcgt | ggaggtgcat | aatgccaaga | 1440 |
| caaagccgcg | ggaggagcag | tacaacagca | cgtaccgtgt | ggtcagcgtc | ctcaccgtcc | 1500 |
| tgcaccagga | ctggctgaat | ggcaaggagt | acaagtgcaa | ggtctccaac | aaagccctcc | 1560 |
| cagcccccat | cgagaaaacc | atctccaaag | ccaaagggtg | gacccgtggg | gtgagggggc | 1620 |
| cacatggaca | gaggccggct | cggccccacc | tctgcccctga | gagtgaccgc | tgtaccaacc | 1680 |
| tctgtcccta | cagggcagcc | cagagaacca | caggtgtaca | ccctgcccc | atcccgggag | 1740 |
| gagatgacca | agaaccaggt | cagcctgacc | tgcttggtca | aaggcttcta | tcccagcgac | 1800 |
| atcgccgtgg | agtgggagag | caatgggcag | ccggagaaca | actacaagac | cacgcctccc | 1860 |
| gtgctggact | ccgacggctc | cttcttcctc | tatagcaagc | tcaccgtgga | caagagcagg | 1920 |
| tggcagcagg | ggaacgtctt | ctcatgctcc | gtgatgcatg | aggctctgca | caaccactac | 1980 |
| acgcagaaga | gcctctccct | gtctccgggt | aaatga | | | 2016 |

<210> 4

<211> 469

<212> PRT

<213> Artificial Sequence

<220>

<223> Heavy chain of CHIR-12.12 human anti-CD40 antibody

<400> 4

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Met Glu Phe Gly Leu Ser Trp Val Phe Leu Val Ala Ile Leu Arg Gly
1      5      10      15
Val Gln Cys Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln
20      25      30
Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
35      40      45
Ser Ser Tyr Gly Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
50      55      60
Glu Trp Val Ala Val Ile Ser Tyr Glu Glu Ser Asn Arg Tyr His Ala
65      70      75      80
Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Ile
85      90      95
Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Thr Glu Asp Thr Ala Val
100     105     110
Tyr Tyr Cys Ala Arg Asp Gly Gly Ile Ala Ala Pro Gly Pro Asp Tyr
115     120     125
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
130     135     140
Pro Ser Val Phe Pro Leu Ala Pro Ala Ser Lys Ser Thr Ser Gly Gly
145     150     155     160
Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
165     170     175
Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
180     185     190
Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
195     200     205
Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
210     215     220
Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys
225     230     235     240
Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
245     250     255
Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
260     265     270
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
275     280     285
Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
290     295     300
Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
305     310     315     320
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
325     330     335
Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
340     345     350
Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
355     360     365
Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
370     375     380
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
385     390     395     400
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
405     410     415
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
420     425     430
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
435     440     445
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
450     455     460
Leu Ser Pro Gly Lys
465

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<210> 5

<211> 469

<212> PRT

<213> Artificial Sequence

<220>

<223> Heavy chain of variant of CHIR-12.12 human
anti-CD40 antibody

<400> 5

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Met Glu Phe Gly Leu Ser Trp Val Phe Leu Val Ala Ile Leu Arg Gly
 1      5      10      15
Val Gln Cys Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln
 20      25      30
Pro Gly Arg Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe
 35      40      45
Ser Ser Tyr Gly Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu
 50      55      60
Glu Trp Val Ala Val Ile Ser Tyr Glu Glu Ser Asn Arg Tyr His Ala
 65      70      75      80
Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Ile
 85      90      95
Thr Leu Tyr Leu Gln Met Asn Ser Leu Arg Thr Glu Asp Thr Ala Val
100      105      110
Tyr Tyr Cys Ala Arg Asp Gly Gly Ile Ala Ala Pro Gly Pro Asp Tyr
115      120      125
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
130      135      140
Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
145      150      155      160
Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
165      170      175
Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
180      185      190
Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
195      200      205
Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
210      215      220
Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys
225      230      235      240
Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
245      250      255
Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
260      265      270
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
275      280      285
Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
290      295      300
Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
305      310      315      320
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
325      330      335
Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
340      345      350
Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
355      360      365
Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln
370      375      380
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
385      390      395      400
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
405      410      415
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
420      425      430
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
435      440      445
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser

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450
Leu Ser Pro Gly Lys
465

455

460

<210> 6
<211> 239
<212> PRT
<213> Artificial Sequence

<220>
<223> Light chain of CHIR-5.9 human anti-CD40 antibody

<400> 6
Met Ala Leu Leu Ala Gln Leu Leu Gly Leu Leu Met Leu Trp Val Pro
1 5 10 15
Gly Ser Ser Gly Ala Ile Val Met Thr Gln Pro Pro Leu Ser Ser Pro
20 25 30
Val Thr Leu Gly Gln Pro Ala Ser Ile Ser Cys Arg Ser Ser Gln Ser
35 40 45
Leu Val His Ser Asp Gly Asn Thr Tyr Leu Asn Trp Leu Gln Gln Arg
50 55 60
Pro Gly Gln Pro Pro Arg Leu Leu Ile Tyr Lys Phe Phe Arg Arg Leu
65 70 75 80
Ser Gly Val Pro Asp Arg Phe Ser Gly Ser Gly Ala Gly Thr Asp Phe
85 90 95
Thr Leu Lys Ile Ser Arg Val Glu Ala Glu Asp Val Gly Val Tyr Tyr
100 105 110
Cys Met Gln Val Thr Gln Phe Pro His Thr Phe Gly Gln Gly Thr Arg
115 120 125
Leu Glu Ile Lys Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro
130 135 140
Pro Ser Asp Glu Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu
145 150 155 160
Leu Asn Asn Phe Tyr Pro Arg Glu Ala Lys Val Gln Trp Lys Val Asp
165 170 175
Asn Ala Leu Gln Ser Gly Asn Ser Gln Glu Ser Val Thr Glu Gln Asp
180 185 190
Ser Lys Asp Ser Thr Tyr Ser Leu Ser Ser Thr Leu Thr Leu Ser Lys
195 200 205
Ala Asp Tyr Glu Lys His Lys Val Tyr Ala Cys Glu Val Thr His Gln
210 215 220
Gly Leu Ser Ser Pro Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
225 230 235

<210> 7
<211> 474
<212> PRT
<213> Artificial Sequence

<220>
<223> Heavy chain of CHIR-5.9 human anti-CD40 antibody

<400> 7
Met Gly Ser Thr Ala Ile Leu Ala Leu Leu Leu Ala Val Leu Gln Gly
1 5 10 15
Val Cys Ala Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
20 25 30
Pro Gly Glu Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe
35 40 45
Thr Ser Tyr Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu
50 55 60
Glu Trp Met Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser
65 70 75 80
Pro Ser Phe Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser

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      85      90      95
Thr Ala Tyr Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met
      100      105      110
Tyr Tyr Cys Ala Arg Gly Thr Ala Ala Gly Arg Asp Tyr Tyr Tyr Tyr
      115      120      125
Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
      130      135      140
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ala Ser Lys
145      150      155      160
Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
      165      170      175
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
      180      185      190
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
      195      200      205
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
210      215      220
Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
225      230      235      240
Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
      245      250      255
Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
260      265      270
Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
275      280      285
Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
290      295      300
Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
305      310      315      320
Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
      325      330      335
His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
340      345      350
Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
355      360      365
Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
370      375      380
Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
385      390      395      400
Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
      405      410      415
Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
420      425      430
Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
435      440      445
Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
450      455      460
Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
465      470

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<210> 8

<211> 474

<212> PRT

<213> Artificial Sequence

<220>

<223> Heavy chain of variant CHIR-5.9 human anti-CD40 antibody

<400> 8

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Met Gly Ser Thr Ala Ile Leu Ala Leu Leu Ala Val Leu Gln Gly
1      5      10      15
Val Cys Ala Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys
20      25      30

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Pro Gly Glu Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser Phe
      35      40      45
Thr Ser Tyr Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly Leu
      50      55      60
Glu Trp Met Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser
      65      70      75      80
Pro Ser Phe Gln Gly Gln Val Thr Ile Ser Ala Asp Lys Ser Ile Ser
      85      90      95
Thr Ala Tyr Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala Met
      100      105      110
Tyr Tyr Cys Ala Arg Gly Thr Ala Ala Gly Arg Asp Tyr Tyr Tyr Tyr
      115      120      125
Tyr Gly Met Asp Val Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
      130      135      140
Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys
      145      150      155      160
Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
      165      170      175
Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
      180      185      190
Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
      195      200      205
Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
      210      215      220
Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
      225      230      235      240
Arg Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
      245      250      255
Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
      260      265      270
Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
      275      280      285
Val Val Val Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp
      290      295      300
Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
      305      310      315      320
Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
      325      330      335
His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
      340      345      350
Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
      355      360      365
Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu
      370      375      380
Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
      385      390      395      400
Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
      405      410      415
Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
      420      425      430
Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
      435      440      445
Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
      450      455      460
Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
      465      470

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<210> 9
 <211> 612
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0) ... (0)

<223> Coding sequence for short isoform of human CD40

<221> CDS

<222> (1)...(612)

<400> 9

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atg gtt cgt ctg cct ctg cag tgc gtc ctc tgg ggc tgc ttg ctg acc 48
Met Val Arg Leu Pro Leu Gln Cys Val Leu Trp Gly Cys Leu Leu Thr
1 5 10 15

gct gtc cat cca gaa cca ccc act gca tgc aga gaa aaa cag tac cta 96
Ala Val His Pro Glu Pro Pro Thr Ala Cys Arg Glu Lys Gln Tyr Leu
20 25 30

ata aac agt cag tgc tgt tct ttg tgc cag cca gga cag aaa ctg gtg 144
Ile Asn Ser Gln Cys Cys Ser Leu Cys Gln Pro Gly Gln Lys Leu Val
35 40 45

agt gac tgc aca gag ttc act gaa acg gaa tgc ctt cct tgc ggt gaa 192
Ser Asp Cys Thr Glu Phe Thr Glu Thr Glu Cys Leu Pro Cys Gly Glu
50 55 60

agc gaa ttc cta gac acc tgg aac aga gag aca cac tgc cac cag cac 240
Ser Glu Phe Leu Asp Thr Trp Asn Arg Glu Thr His Cys His Gln His
65 70 75 80

aaa tac tgc gac ccc aac cta ggg ctt cgg gtc cag cag aag ggc acc 288
Lys Tyr Cys Asp Pro Asn Leu Gly Leu Arg Val Gln Gln Lys Gly Thr
85 90 95

tca gaa aca gac acc atc tgc acc tgt gaa gaa ggc tgg cac tgt acg 336
Ser Glu Thr Thr Ile Cys Thr Cys Glu Glu Gly Trp His Cys Thr
100 105 110

agt gag gcc tgt gag agc tgt gtc ctg cac cgc tca tgc tcg ccc ggc 384
Ser Glu Ala Cys Glu Ser Cys Val Leu His Arg Ser Cys Ser Pro Gly
115 120 125

ttt ggg gtc aag cag att gct aca ggg gtt tct gat acc atc tgc gag 432
Phe Gly Val Lys Gln Ile Ala Thr Gly Val Ser Asp Thr Ile Cys Glu
130 135 140

ccc tgc cca gtc ggc ttc ttc tcc aat gtg tca tct gct ttc gaa aaa 480
Pro Cys Pro Val Gly Phe Phe Ser Asn Val Ser Ser Ala Phe Glu Lys
145 150 155 160

tgt cac cct tgg aca agg tcc cca gga tcg gct gag agc cct ggt ggt 528
Cys His Pro Trp Thr Arg Ser Pro Gly Ser Ala Glu Ser Pro Gly Gly
165 170 175

gat ccc cat cat ctt cgg gat cct gtt tgc cat cct ctt ggt gct ggt 576
Asp Pro His His Leu Arg Asp Pro Val Cys His Pro Leu Gly Ala Gly
180 185 190

ctt tat caa aaa ggt ggc caa gaa gcc aac caa taa 612
Leu Tyr Gln Lys Gly Gly Gln Glu Ala Asn Gln *
195 200

```

<210> 10

<211> 203

<212> PRT

<213> Homo sapiens

<400> 10

Met Val Arg Leu Pro Leu Gln Cys Val Leu Trp Gly Cys Leu Leu Thr

```

      1           5           10           15
Ala Val His Pro Glu Pro Pro Thr Ala Cys Arg Glu Lys Gln Tyr Leu
      20           25           30
Ile Asn Ser Gln Cys Cys Ser Leu Cys Gln Pro Gly Gln Lys Leu Val
      35           40           45
Ser Asp Cys Thr Glu Phe Thr Glu Thr Glu Cys Leu Pro Cys Gly Glu
      50           55           60
Ser Glu Phe Leu Asp Thr Trp Asn Arg Glu Thr His Cys His Gln His
      65           70           75           80
Lys Tyr Cys Asp Pro Asn Leu Gly Leu Arg Val Gln Gln Lys Gly Thr
      85           90           95
Ser Glu Thr Asp Thr Ile Cys Thr Cys Glu Glu Gly Trp His Cys Thr
      100          105          110
Ser Glu Ala Cys Glu Ser Cys Val Leu His Arg Ser Cys Ser Pro Gly
      115          120          125
Phe Gly Val Lys Gln Ile Ala Thr Gly Val Ser Asp Thr Ile Cys Glu
      130          135          140
Pro Cys Pro Val Gly Phe Phe Ser Asn Val Ser Ser Ala Phe Glu Lys
      145          150          155          160
Cys His Pro Trp Thr Arg Ser Pro Gly Ser Ala Glu Ser Pro Gly Gly
      165          170          175
Asp Pro His His Leu Arg Asp Pro Val Cys His Pro Leu Gly Ala Gly
      180          185          190
Leu Tyr Gln Lys Gly Gly Gln Glu Ala Asn Gln
      195          200

```

<210> 11

<211> 834

<212> DNA

<213> Homo sapiens

<220>

<221> misc_feature

<222> (0)...(0)

<223> Coding sequence for long isoform of human CD40

<221> CDS

<222> (1)...(834)

<400> 11

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atg gtt cgt ctg cct ctg cag tgc gtc ctc tgg ggc tgc ttg ctg acc 48
Met Val Arg Leu Pro Leu Gln Cys Val Leu Trp Gly Cys Leu Leu Thr
      1           5           10           15

gct gtc cat cca gaa cca ccc act gca tgc aga gaa aaa cag tac cta 96
Ala Val His Pro Glu Pro Pro Thr Ala Cys Arg Glu Lys Gln Tyr Leu
      20           25           30

ata aac agt cag tgc tgt tct ttg tgc cag cca gga cag aaa ctg gtg 144
Ile Asn Ser Gln Cys Cys Ser Leu Cys Gln Pro Gly Gln Lys Leu Val
      35           40           45

agt gac tgc aca gag ttc act gaa acg gaa tgc ctt cct tgc ggt gaa 192
Ser Asp Cys Thr Glu Phe Thr Glu Thr Glu Cys Leu Pro Cys Gly Glu
      50           55           60

agc gaa ttc cta gac acc tgg aac aga gag aca cac tgc cac cag cac 240
Ser Glu Phe Leu Asp Thr Trp Asn Arg Glu Thr His Cys His Gln His
      65           70           75           80

aaa tac tgc gac ccc aac cta ggg ctt cgg gtc cag cag aag ggc acc 288
Lys Tyr Cys Asp Pro Asn Leu Gly Leu Arg Val Gln Gln Lys Gly Thr
      85           90           95

tca gaa aca gac acc atc tgc acc tgt gaa gaa ggc tgg cac tgt acg 336

```

```

Ser Glu Thr Asp Thr Ile Cys Thr Cys Glu Glu Gly Trp His Cys Thr
      100                      105                      110

agt gag gcc tgt gag agc tgt gtc ctg cac cgc tca tgc tcg ccc ggc 384
Ser Glu Ala Cys Glu Ser Cys Val Leu His Arg Ser Cys Ser Pro Gly
      115                      120                      125

ttt ggg gtc aag cag att gct aca ggg gtt tct gat acc atc tgc gag 432
Phe Gly Val Lys Gln Ile Ala Thr Gly Val Ser Asp Thr Ile Cys Glu
      130                      135                      140

ccc tgc cca gtc ggc ttc ttc tcc aat gtg tca tct gct ttc gaa aaa 480
Pro Cys Pro Val Gly Phe Phe Ser Asn Val Ser Ser Ala Phe Glu Lys
      145                      150                      155

tgt cac cct tgg aca agc tgt gag acc aaa gac ctg gtt gtg caa cag 528
Cys His Pro Trp Thr Ser Cys Glu Thr Lys Asp Leu Val Val Gln Gln
      165                      170                      175

gca ggc aca aac aag act gat gtt gtc tgt ggt ccc cag gat cgg ctg 576
Ala Gly Thr Asn Lys Thr Asp Val Val Cys Gly Pro Gln Asp Arg Leu
      180                      185                      190

aga gcc ctg gtg gtg atc ccc atc atc ttc ggg atc ctg ttt gcc atc 624
Arg Ala Leu Val Ile Pro Ile Ile Phe Gly Ile Leu Phe Ala Ile
      195                      200                      205

ctc ttg gtg ctg gtc ttt atc aaa aag gtg gcc aag aag cca acc aat 672
Leu Leu Val Leu Val Phe Ile Lys Lys Val Ala Lys Lys Pro Thr Asn
      210                      215                      220

aag gcc ccc cac ccc aag cag gaa ccc cag gag atc aat ttt ccc gac 720
Lys Ala Pro His Lys Gln Glu Pro Gln Glu Ile Asn Phe Pro Asp
      225                      230                      235

gat ctt cct ggc tcc aac act gct gct cca gtg cag gag act tta cat 768
Asp Leu Pro Gly Ser Asn Thr Ala Ala Pro Val Gln Glu Thr Leu His
      245                      250                      255

gga tgc caa ccg gtc acc cag gag gat ggc aaa gag agt cgc atc tca 816
Gly Cys Gln Pro Val Thr Gln Glu Asp Gly Lys Glu Ser Arg Ile Ser
      260                      265                      270

gtg cag gag aga cag tga
Val Gln Glu Arg Gln *
      275

```

<210> 12

<211> 277

<212> PRT

<213> Homo sapiens

<400> 12

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Met Val Arg Leu Pro Leu Gln Cys Val Leu Trp Gly Cys Leu Leu Thr
  1          5          10          15
Ala Val His Pro Glu Pro Pro Thr Ala Cys Arg Glu Lys Gln Tyr Leu
      20          25          30
Ile Asn Ser Gln Cys Cys Ser Leu Cys Gln Pro Gly Gln Lys Leu Val
      35          40          45
Ser Asp Cys Thr Glu Phe Thr Glu Thr Glu Cys Leu Pro Cys Gly Glu
      50          55          60
Ser Glu Phe Leu Asp Thr Trp Asn Arg Glu Thr His Cys His Gln His
      65          70          75          80
Lys Tyr Cys Asp Pro Asn Leu Gly Leu Arg Val Gln Gln Lys Gly Thr
      85          90          95

```

```

Ser Glu Thr Asp Thr Ile Cys Thr Cys Glu Glu Gly Trp His Cys Thr
      100      105      110
Ser Glu Ala Cys Glu Ser Cys Val Leu His Arg Ser Cys Ser Pro Gly
      115      120      125
Phe Gly Val Lys Gln Ile Ala Thr Gly Val Ser Asp Thr Ile Cys Glu
      130      135      140
Pro Cys Pro Val Gly Phe Phe Ser Asn Val Ser Ser Ala Phe Glu Lys
145      150      155      160
Cys His Pro Trp Thr Ser Cys Glu Thr Lys Asp Leu Val Val Gln Gln
      165      170      175
Ala Gly Thr Asn Lys Thr Asp Val Val Cys Gly Pro Gln Asp Arg Leu
      180      185      190
Arg Ala Leu Val Val Ile Pro Ile Ile Phe Gly Ile Leu Phe Ala Ile
      195      200      205
Leu Leu Val Leu Val Phe Ile Lys Lys Val Ala Lys Lys Pro Thr Asn
      210      215      220
Lys Ala Pro His Pro Lys Gln Glu Pro Gln Glu Ile Asn Phe Pro Asp
225      230      235      240
Asp Leu Pro Gly Ser Asn Thr Ala Ala Pro Val Gln Glu Thr Leu His
      245      250      255
Gly Cys Gln Pro Val Thr Gln Glu Asp Gly Lys Glu Ser Arg Ile Ser
      260      265      270
Val Gln Glu Arg Gln
      275

```

<210> 13
 <211> 459
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> Human IL-2 precursor

<221> CDS
 <222> (1)...(459)

```

<400> 13
atg tac agg atg caa ctc ctg tct tgc att gca cta agt ctt gca ctt 48
Met Tyr Arg Met Gln Leu Leu Ser Cys Ile Ala Leu Ser Leu Ala Leu
1 5 10 15

gtc gca aac agt gca cct act tca agt tct aca aag aaa aca cag cta 96
Val Ala Asn Ser Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu
20 25 30

caa ctg gag cat tta ctg ctg gat tta cag atg att ttg aat gga att 144
Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile
35 40 45

aat aat tac aag aat ccc aaa ctc acc agg atg ctc aca ttt aag ttt 192
Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe
50 55 60

tac atg ccc aag aag gcc aca gaa ctg aaa cat ctt cag tgt cta gaa 240
Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu
65 70 75 80

gaa gaa ctc aaa cct ctg gag gaa gtg cta aat tta gct caa agc aaa 288
Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys
85 90 95

aac ttt cac tta aga ccc agg gac tta atc agc aat atc aac gta ata 336
Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile

```

| 100 | 105 | 110 | |
|-----------------------------------------------------------------|-----|-----|-----|
| gtt ctg gaa cta aag gga tct gaa aca aca ttc atg tgt gaa tat gct | | | 384 |
| Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala | | | |
| 115 | 120 | 125 | |
| gat gag aca gca acc att gta gaa ttt ctg aac aga tgg att acc ttt | | | 432 |
| Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe | | | |
| 130 | 135 | 140 | |
| tgt cag agc atc atc tca aca ctg act | | | 459 |
| Cys Gln Ser Ile Ile Ser Thr Leu Thr | | | |
| 145 | 150 | | |

<210> 14
 <211> 153
 <212> PRT
 <213> Homo sapiens

<400> 14
 Met Tyr Arg Met Gln Leu Leu Ser Cys Ile Ala Leu Ser Leu Ala Leu
 1 5 10 15
 Val Ala Asn Ser Ala Pro Thr Ser Ser Thr Lys Lys Thr Gln Leu
 20 25 30
 Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile
 35 40 45
 Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe
 50 55 60
 Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu
 65 70 75 80
 Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys
 85 90 95
 Asn Phe His Leu Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile
 100 105 110
 Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala
 115 120 125
 Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe
 130 135 140
 Cys Gln Ser Ile Ile Ser Thr Leu Thr
 145 150

<210> 15
 <211> 399
 <212> DNA
 <213> Homo sapiens

<220>
 <221> misc_feature
 <222> (0)...(0)
 <223> Mature human IL-2

<221> CDS
 <222> (1)...(399)

<400> 15
 gca cct act tca agt tct aca aag aaa aca cag cta caa ctg gag cat 48
 Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
 1 5 10 15
 tta ctg ctg gat tta cag atg att ttg aat gga att aat aat tac aag 96
 Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
 20 25 30
 aat ccc aaa ctc acc agg atg ctc aca ttt aag ttt tac atg ccc aag 144

```

Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro Lys
      35              40              45

aag gcc aca gaa ctg aaa cat ctt cag tgt cta gaa gaa gaa ctc aaa 192
Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys
      50              55              60

cct ctg gag gaa gtg cta aat tta gct caa agc aaa aac ttt cac tta 240
Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu
      65              70              75              80

aga ccc agg gac tta atc agc aat atc aac gta ata gtt ctg gaa cta 288
Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu
      85              90              95

aag gga tct gaa aca aca ttc atg tgt gaa tat gct gat gag aca gca 336
Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
      100              105              110

acc att gta gaa ttt ctg aac aga tgg att acc ttt tgt cag agc atc 384
Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
      115              120              125

atc tca aca ctg act 399
Ile Ser Thr Leu Thr
      130

```

<210> 16
 <211> 133
 <212> PRT
 <213> Homo sapiens

```

<400> 16
Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His
1      5      10      15
Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys
      20      25      30
Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro Lys
      35      40      45
Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys
      50      55      60
Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu
      65      70      75      80
Arg Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu
      85      90      95
Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala
      100      105      110
Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Cys Gln Ser Ile
      115      120      125
Ile Ser Thr Leu Thr
      130

```

<210> 17
 <211> 396
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> des-alanyl 1, C125S human IL-2 mutein

<221> CDS
 <222> (1)...(396)

<400> 17

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cct act tca agt tct aca aag aaa aca cag cta caa ctg gag cat tta 48
Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His Leu
1 5 10 15

ctg ctg gat tta cag atg att ttg aat gga att aat aat tac aag aat 96
Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn
20 25 30

ccc aaa ctc acc agg atg ctc aca ttt aag ttt tac atg ccc aag aag 144
Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro Lys Lys
35 40 45

gcc aca gaa ctg aaa cat ctt cag tgt cta gaa gaa gaa ctc aaa cct 192
Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys Pro
50 55 60

ctg gag gaa gtg cta aat tta gct caa agc aaa aac ttt cac tta aga 240
Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu Arg
65 70 75 80

ccc agg gac tta atc agc aat atc aac gta ata gtt ctg gaa cta aag 288
Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys
85 90 95

gga tct gaa aca aca ttc atg tgt gaa tat gct gat gag aca gca acc 336
Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr
100 105 110

att gta gaa ttt ctg aac aga tgg att acc ttt tct cag agc atc atc 384
Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Ser Gln Ser Ile Ile
115 120 125

tca aca ctg act 396
Ser Thr Leu Thr
130

```

<210> 18

<211> 132

<212> PRT

<213> Artificial Sequence

<220>

<223> des-alanyl 1, C125S human IL-2 mutein

<400> 18

```

Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu Gln Leu Glu His Leu
1 5 10 15
Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile Asn Asn Tyr Lys Asn
20 25 30
Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe Tyr Met Pro Lys Lys
35 40 45
Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu Glu Glu Leu Lys Pro
50 55 60
Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys Asn Phe His Leu Arg
65 70 75 80
Pro Arg Asp Leu Ile Ser Asn Ile Asn Val Ile Val Leu Glu Leu Lys
85 90 95
Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala Asp Glu Thr Ala Thr
100 105 110
Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe Ser Gln Ser Ile Ile
115 120 125
Ser Thr Leu Thr
130

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